

*This listing of claims will replace all prior versions, and listings of the claims in the application:*

1. (Cancelled)

2. (Cancelled)

3. (Currently Amended) ~~The method of claim 2,~~

A method for fuel driveability index detection, comprising:

measuring an exhaust gas feedstream of an internal combustion engine with an oxygen sensor;

obtaining a first input signal indicating a first oxygen sensor voltage;

obtaining a second input signal indicating a second oxygen sensor voltage at a period subsequent to said first input signal;

determining a first voltage trend based on said first input signal and said second input signal; and

determining whether said first voltage trend is decreasing at a rate greater than a first voltage threshold rate; and,

adjusting open loop fueling if said first voltage trend is decreasing at a rate greater than said first voltage threshold rate;

wherein said adjusting ~~said~~ open loop fueling occurs within about five seconds of a cold start of the internal combustion an engine.

4. (Currently Amended) The method of ~~claim 2~~ claim 3, wherein said adjusting said open loop fueling includes adding fuel to combustion chambers of the internal combustion an engine.

5. (Original)           The method of claim 4, wherein said adding fuel is accomplished by increasing a base pulse width command to fuel injectors of said engine.

6. (Currently Amended)       The method of ~~claim 1-claim 3~~, further including sensing an engine run condition prior to obtaining said first input signal.

7. (Original)           The method of claim 6, wherein said sensing said engine run condition includes determining whether a software logic flag indicating an engine run condition has been set.

8. (Original)           The method of claim 6, further including determining whether cold start is enabled if said engine run condition is sensed.

9. (Original)           The method of claim 8, further including determining whether an engine crank time is exceeded if said cold start is enabled.

10. (Currently Amended)   The method of ~~claim 1~~ claim 3, further including determining whether closed loop fueling is disabled prior to obtaining said second input signal.

11. (Currently Amended)   The method of ~~claim 1~~ claim 3, further including determining whether engine coolant temperature is within a temperature operating window prior to obtaining said second input signal.

12. (Currently Amended)   The method of ~~claim 1~~ claim 3, wherein said first input signal is saved for a period.

13. (Previously Amended)   A method for fuel driveability index detection, the method comprising:

obtaining a first input signal indicating a first oxygen sensor voltage;

obtaining a second input signal indicating a second oxygen sensor voltage at a period subsequent to said first input signal;

determining a first voltage trend based on said first input signal and said second input signal; and

determining whether said first voltage trend is decreasing at a rate greater than a first voltage threshold rate, wherein a software logic flag indicating a high driveability index is set if said first voltage trend is decreasing at a rate greater than said first voltage threshold rate.

14. (Previously Amended) A method for fuel driveability index detection, the method comprising:

obtaining a first input signal indicating a first oxygen sensor voltage;

obtaining a second input signal indicating a second oxygen sensor voltage at a period subsequent to said first input signal;

determining a first voltage trend based on said first input signal and said second input signal; and

determining whether said first voltage trend is decreasing at a rate greater than a first voltage threshold rate;

determining whether said first voltage trend is increasing at a rate greater than a second voltage threshold rate if said first voltage trend is not decreasing at a rate greater than said first voltage threshold rate; and

determining whether an engine run timer is less than an engine run timer threshold if said first voltage trend is not increasing at a rate greater than said second voltage threshold rate.

15. (Original) The method of claim 14, wherein a software logic flag indicating a low driveability index is set if said first voltage trend is increasing at a rate greater than said second voltage threshold rate.

16. (Original) The method of claim 14, further including:

obtaining a next input signal indicating a next oxygen sensor voltage if said engine run timer is less than said engine run timer threshold;

determining a second voltage trend based on said first input signal and said next input signal; and

determining whether said second voltage trend is decreasing at a rate greater than said first voltage threshold rate.

17. (Original) The method of claim 16, further including adjusting open loop fueling if said second voltage trend is decreasing at a rate greater than said first voltage threshold rate.

18. (Original) The method of claim 16, wherein a software logic flag indicating a high driveability index is set if said second voltage trend is decreasing at a rate greater than said first voltage threshold rate.

19. (Cancelled)

20. (Currently Amended) A system for fuel driveability index detection, the system comprising:

an internal combustion engine;

an oxygen sensor disposed within the exhaust gas passage of said engine;

an engine control module operatively connected to said engine; and

said engine control module having a processor for obtaining a first input signal indicating a first oxygen sensor voltage, obtaining a second input signal indicating a second oxygen sensor voltage at a period subsequent to said first input signal, determining a first voltage trend based on said first input signal and said second input signal, ~~and~~ determining whether said first voltage trend is decreasing at a rate greater than a first voltage threshold rate, and adjusting open loop fueling if said first voltage trend is decreasing at a rate greater than said first voltage threshold rate, wherein adjusting open loop fueling occurs within about five seconds of a cold start of the internal combustion engine.

Claims 21 – 31 (Cancelled)

32. (Previously Amended) A system for fuel driveability index detection, the system comprising:  
an engine;

an oxygen sensor disposed within the exhaust gas passage of said engine;  
an engine control module operatively connected to said engine; and  
said engine control module having a processor for obtaining a first input signal indicating a first oxygen sensor voltage, obtaining a second input signal indicating a second oxygen sensor voltage at a period subsequent to said first input signal, determining a first voltage trend based on said first input signal and said second input signal and determining whether said first voltage trend is decreasing at a rate greater than a first voltage threshold rate, wherein a software logic flag indicating a high driveability index is set if said first voltage trend is decreasing at a rate greater than said first voltage threshold rate.

33. (Previously Amended) A system for fuel driveability index detection, the system comprising:

an engine;  
an oxygen sensor disposed within the exhaust gas passage of said engine;  
an engine control module operatively connected to said engine; and  
said engine control module having a processor for obtaining a first input signal indicating a first oxygen sensor voltage, obtaining a second input signal indicating a second oxygen sensor voltage at a period subsequent to said first input signal, determining a first voltage trend based on said first input signal and said second input signal and determining whether said first voltage trend is decreasing at a rate greater than a first voltage threshold rate further including said processor:

determining whether said first voltage trend is increasing at a rate greater than a second voltage threshold rate if said first voltage trend is not decreasing at a rate greater than said first voltage threshold rate; and

determining whether an engine run timer is less than an engine run timer threshold if said first voltage trend is not increasing at a rate greater than said second voltage threshold rate.

34. (Original) The system of claim 33, wherein a software logic flag indicating a low driveability index is set if said first voltage trend is increasing at a rate greater than said second voltage threshold rate.

35. (Original)           The system of claim 33, further including said processor:  
                          obtaining a next input signal indicating a next oxygen sensor voltage if said  
engine run timer is less than said engine run timer threshold;  
                          determining a second voltage trend based on said first input signal and said next  
input signal; and  
                          determining whether said second voltage trend is decreasing at a rate greater than  
said first voltage threshold rate.

36. (Original)           The system of claim 35, further including said processor adjusting open  
loop fueling if said second voltage trend is decreasing at a rate greater than said first voltage  
threshold rate.

37. (Original)           The system of claim 35, wherein a software logic flag indicating a high  
driveability index is set if said second voltage trend is decreasing at a rate greater than said first  
voltage threshold rate.

Claims 38 – 42           (Cancelled)